

NCP-19-7586



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

②

D5610-1TRN
Job Sheet 197719



Part No: D5610-1TRN

Job Qty: 1 pcs

Part Name: EC130 Aft Crosstube Turning Detail



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 7/15/19

Job Tracking No:

Due Date: 7/26/19

Created By: Marie Lajeunesse

Type: SOLD

Description:

Note: D5610 REV.B IPP REV:A 18.07.04 NEW ISSUE DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
100	Mori Seiki TL-40 - 1	1 pcs	7/26/19	7/26/19	1.00	2.00	Mori Seiki TL-40 - 1		DAS 662019-07-22 9-89
110	QC 2	1 pcs	7/26/19	7/26/19	0.00	0.00	QC 2 - 1		
							QC 2 - 12		
							QC 2 - 14		
							QC 2 - 17		
							QC 2 - 19		
							QC 2 - 2		
							QC 2 - 20		
							QC 2 - 22		
							QC 2 - 23		
							QC 2 - 25		
							QC 2 - 32		
							QC 2 - 33		
							QC 2 - 35		
							QC 2 - 39		
							QC 2 - 4		
							QC 2 - 40		
							QC 2 - 44		
							QC 2 - 45		
							QC 2 - 48		
							QC 2 - 49		
							QC 2 - 50		
							QC 2 - 51		
							QC 2 - 52		
							QC 2 - 57		
							QC 2 - 62		
							QC 2 - 63		
							QC 2 - 8		DAS
							QC 2 - 66		662019-07-22
							QC 2 - 64		9-89
							QC 2 - 65		

Plex 7/15/19 3:30 PM Dart.lajeunesse.marie

P.T.O.

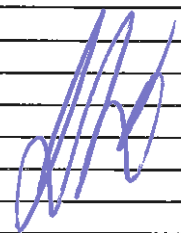
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	
120	Mori Seiki TL-40 - 1 - B4B	1 pcs	7/26/19	1.00 2.00	Mori Seiki TL-40 - 1 - B4B	DAS 662019-07-23 9-89
130	QC 2	1 pcs	7/26/19	0.00 0.00	QC 2 - 1	
					QC 2 - 12	
					QC 2 - 14	
					QC 2 - 17	
					QC 2 - 19	
					QC 2 - 2	
					QC 2 - 20	
					QC 2 - 22	
					QC 2 - 23	
					QC 2 - 25	
					QC 2 - 32	
					QC 2 - 33	
					QC 2 - 35	
					QC 2 - 39	
					QC 2 - 4	
					QC 2 - 40	
					QC 2 - 44	
					QC 2 - 45	
					QC 2 - 48	
					QC 2 - 49	
					QC 2 - 50	
					QC 2 - 51	
					QC 2 - 52	
					QC 2 - 57	
					QC 2 - 62	
					QC 2 - 63	
					QC 2 - 8	
					QC 2 - 66	DAS 662019-07-23 9-89
					QC 2 - 64	
					QC 2 - 65	
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	
140	QC 8	1 pcs	7/26/19	0.00 0.00	QC 8 - 12	
					QC 8 - 14	
					QC 8 - 17	
					QC 8 - 20	
					QC 8 - 25	
					QC 8 - 3	
					QC 8 - 32	
					QC 8 - 33	
					QC 8 - 35	
					QC 8 - 39	
					QC 8 - 4	
					QC 8 - 44	
					QC 8 - 45	
					QC 8 - 49	
					QC 8 - 58	
					QC 8 - 8	
					QC 8 - 9	
					QC 8 - 68	
					QC 8 - 67	
					QC 8 - 1 (A)	

					QC 8 - 47	
					QC 8 - 40	
					QC 8 - 52	
					QC 8 - 23	
					QC 8 - 57	
145 Crosstubes - 4 - B4B	1 pcs	7/26/19	0.00	0.67	Crosstubes - 1 - B4B	
					Crosstubes - 2 - B4B	
					Crosstubes - 3 - B4B	
					Crosstubes - 4 - B4B	
150 Crosstubes - 5 - B4B	1 pcs	7/26/19	0.00	1.00	Crosstubes - 1 - B4B	
					Crosstubes - 2 - B4B	
					Crosstubes - 3 - B4B	
					Crosstubes - 4 - B4B	
160 QC 7	1 pcs	7/26/19	0.00	0.00	QC 7 - 10	
					QC 7 - 13	
					QC 7 - 14	
					QC 7 - 15	
					QC 7 - 17	
					QC 7 - 18	
					QC 7 - 19	
					QC 7 - 2	
					QC 7 - 28	
					QC 7 - 3	
					QC 7 - 30	
					QC 7 - 34	
					QC 7 - 36	
					QC 7 - 37	
					QC 7 - 41	
					QC 7 - 47	
					QC 7 - 48	
					QC 7 - 51	
					QC 7 - 58	
					QC 7 - 59	
					QC 7 - 60	
					QC 7 - 9	
					QC 7 - 68	
					QC 7 - 50	
					QC 7 - 67	
					QC 7 - 40	
					QC 7 - 24	
					QC 7 - 43	
					QC 7 - 61	
					QC 7 - 81	
170 Packaging 3-1 - Stock - B4B	1 pcs	7/26/19	0.00	0.00	Packaging 3 - 1 - B4B	
					Packaging 3 - 2 - B4B	
					Packaging 3 - 3 - B4B	
					Packaging 3 - 4 - B4B	
					Packaging 3 - 5 - B4B	
					Packaging 3 - 6 - B4B	
					Packaging 3 - 7 - B4B	
					Packaging 3 - 8 - B4B	
					Packaging 3 - 9 - B4B	
					Packaging 3 - 10 - B4B	
					Packaging 3 - 11 - B4B	
					Packaging 3 - 12 - B4B	
					Packaging 3 - 13 - B4B	
					Packaging 3 - 14 - B4B	
					Packaging 3 - 15 - B4B	
					Packaging 3 - 16 - B4B	

TU

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BE



				Packaging 3 - 17 - B4B	
				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	
				Packaging 3 - 25 - B4B	
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	
				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
				Packaging 3 - 36 - B4B	
180 QC 21 - SA	1 pcs	7/26/19	0.00 0.00	QC 21 - SA - 21	
				QC 21 - SA - 70	
				QC 21 - SA - 53	

AUG 01 2019

Part Op 100 - 1- Fill tube with sand & install plugs 2- Face and chamfer both ends as per Folio FC197 3- Turn first taper section on
 Descriptions: both side

110 - QC2- Inspect parts off machine FAI/FAIB

120 - 1- Turn second taper on both side 2- Scribe part # and batch # using vibrating stylus on INSIDE the cuff as per Dwg D5610-TRN

130 - QC2- Inspect parts off machine FAI/FAIB

140 - QC8- Inspect parts - second check

145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

150 - 1- handfinish X-TUBE INSIDE AND OUT

160 - ***IDENTIFY SERIAL/ P/N # BY USING A MARKER IN THE MIDDLE OF TUBE AT CONTAINER CREATION***

INSPECT ALODINE AND MAKE SURE TUBE IS IDENTIFY WITH MARKER IN THE MIDDLE OF THE TUBE

170 - ***IDENTIFY SERIAL # BY USING A MARKER IN THE MIDDLE OF TUBE AT CONTAINER CREATION***

INSPECT ALODINE AND MAKE SURE TUBE IS IDENTIFY WITH MARKER IN THE MIDDLE OF THE TUBE

180 - QC21- Final Inspection - Work Order Release

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D6030-140	Tube, Seamless	1 pcs (1 ea)	100-Mori Seiki TL-40 - 1	5193460

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
100-Mori Seiki TL-40 - 1	D6030-140	1	17	0

Part Specifications

Specifications could not be found.



Container No: S199599



Part: D5610-1TRN

Job No: 197719

Serial No/Batch: S199599

Revision: B

Inspector:

Exp Date:

Instructions: Various STC's

Dart Aerospace Ltd.
 1270 Aberdeen Street
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 CANADA
 TEL: 1 813 632-6200
 Email: sales@dartaero.com
 www.dartaerospace.com

Plex 7/15/19 3:30 PM Dart.lajeunesse.marie

Date: 07/22/19

2

DART AEROSPACE LTD		Work Order: 197719
Description: Crosstube Assembly		Part Number: D5610-17AN
Inspection Dwg: B	Rev: B	Page 1 of 2

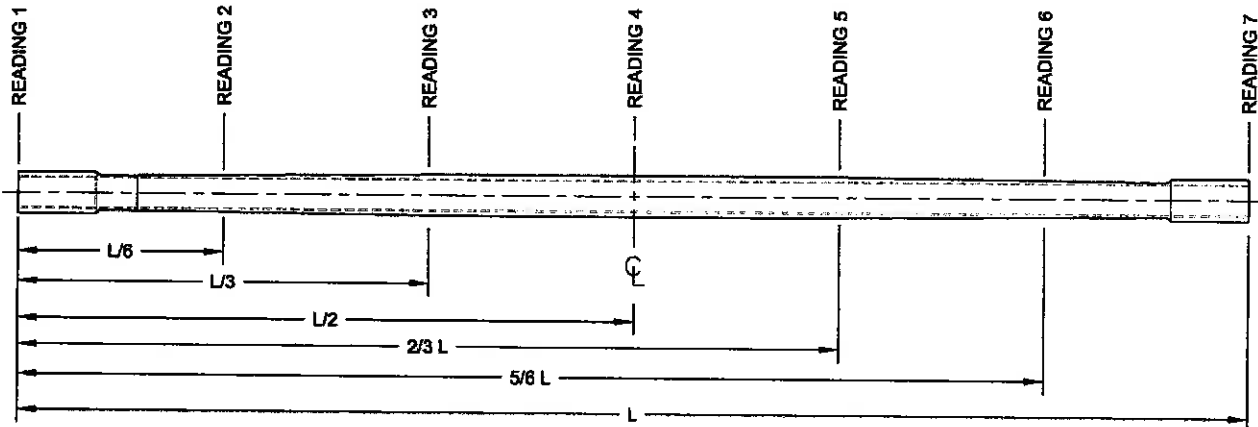
FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	3.300	+0.005/-0.000	3.305	✓		CNC-05	
	3.344	+0.005/-0.000	3.349	✓		"	
	3.398	+0.005/-0.000	3.403	✓		"	
	3.457	+0.005/-0.000	3.462	✓		"	
	3.518	+0.005/-0.000	3.523	✓		"	
	3.543	+0.005/-0.000	3.541	✓		"	Stock Mat.
SIDE B	3.300	+0.005/-0.000	3.305	✓		CNC-05	
	3.344	+0.005/-0.000	3.349	✓		"	
	3.398	+0.005/-0.000	3.403	✓		"	
	3.457	+0.005/-0.000	3.462	✓		"	
	3.518	+0.005/-0.000	3.523	✓		"	
	3.543	+0.005/-0.000	3.542	✓		"	Stock Mat.
	116.26	+/- 0.30	116.255	✓		Tape	

②

DART AEROSPACE LTD		Work Order: 197719
Description: Crosstube Assembly		Part Number: D3610-1TRN
Inspection Dwg: 8	Rev: B	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.179	.187	.206	.184	.027	x/ .030 0.315
READING 2 L= 19.38	.240	.254	.257	.234	.023	
READING 3 L= 38.75	.316	.315	.305	.310	.011	
READING 4 L= 58.13	.314	.314	.316	.317	.003	
READING 5 L= 77.51	.301	.315	.316	.304	.015	
READING 6 L= 96.88	.248	.246	.244	.252	.008	
READING 7 L= 116.26	.181	.182	.202	.197	.021	

Calibration Result

Actual Block Thickness: 100-400

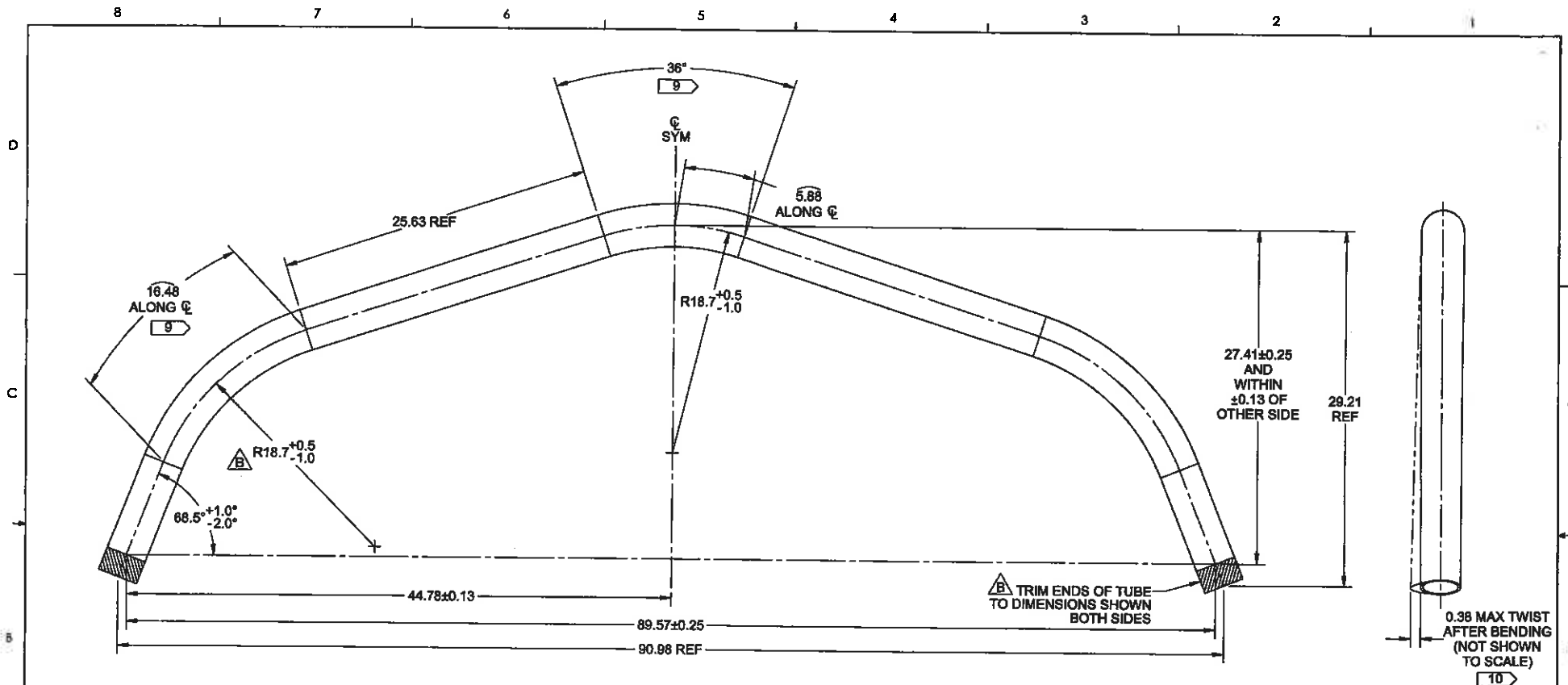
Sitescan 250 Measured Thickness: 100-400

Measured by:	DAS 66
Date:	2019-07-23

Audited by:	DAS 47
Date:	19-07-29

Preliminary Approval:	
Date:	

Rev	Date	Change	Revised by	Approved
B	10.04.14	Added preliminary approval	KJ	
C	12.06.01	Wall thickness form added	KJ	



D5610-1 AFT X-TUBE (EC130)

NOTES:

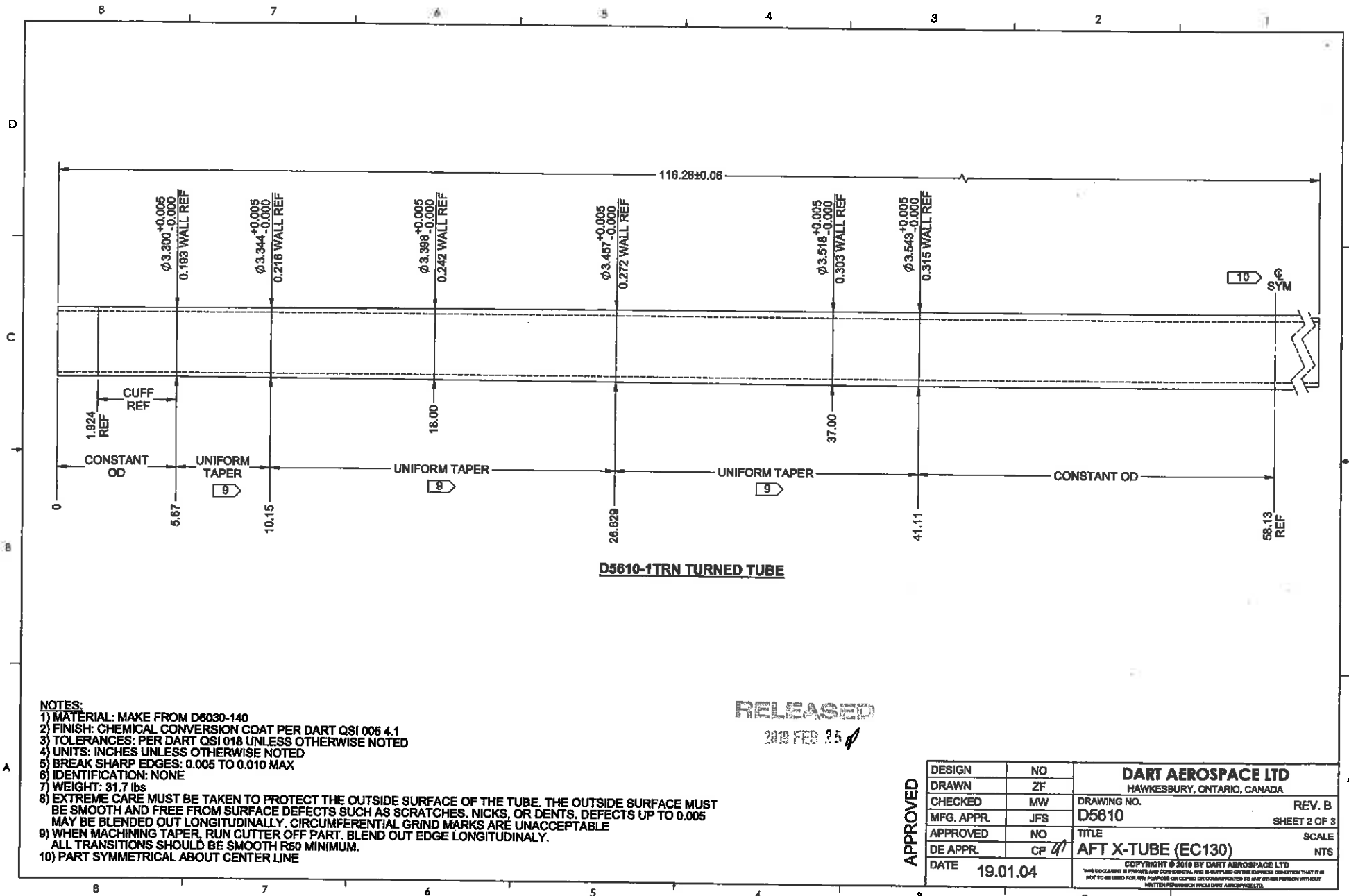
- 1) MATERIAL: MAKE FROM D5610-1TRN
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 30.9 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, WRINKLES, OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE
- 9) MAX AMPLITUDE OF RIPPLING ALONG BENT PORTION OF THE TUBE IS 0.030. MAX CRUSHING 2% OVER ALL BEND LOCATIONS.
- 10) MAX TWIST: WITH TUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN THE CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38

RELEASED

2019 FEB 25
2019.19.54

B	D5610-1: ADDED OUTER BENDS AND TRIM ENDS, REMOVED SECTION A-A		ZF	19.01.04
	D5610-3: DELETED Ø0.395 HOLES FOR SADDLES, SECTION C-C CSINK HOLES QTY 4 WAS QTY 6, DIM 0.835 WAS 0.875, 2.805 WAS 2.932			
A	NEW ISSUE		ZF	18.05.07
REV.	DESCRIPTION		BY	DATE
DESIGN	NO	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
DRAWN	ZF			
CHECKED	MW	DRAWING NO.		REV. B
MFG. APPR.	JFS	D5610		SHEET 1 OF 3
APPROVED	NO	TITLE		SCALE
DE APPR.	CP 47	AFT X-TUBE (EC130)		NTS
DATE	19.01.04	COPYRIGHT © 2019 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		

APPROVED



D5610-1TRN TURNED TUBE

NOTES:

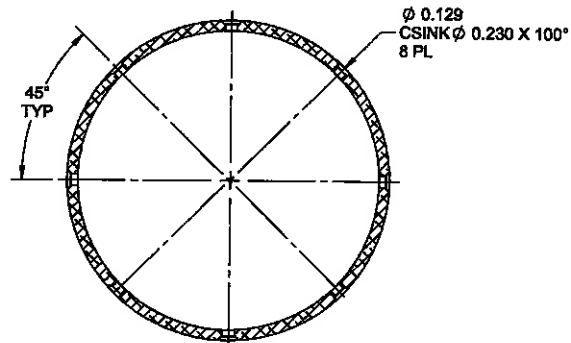
- 1) MATERIAL: MAKE FROM D6030-140
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 31.7 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE
- 9) WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. ALL TRANSITIONS SHOULD BE SMOOTH R50 MINIMUM.
- 10) PART SYMMETRICAL ABOUT CENTER LINE

RELEASED

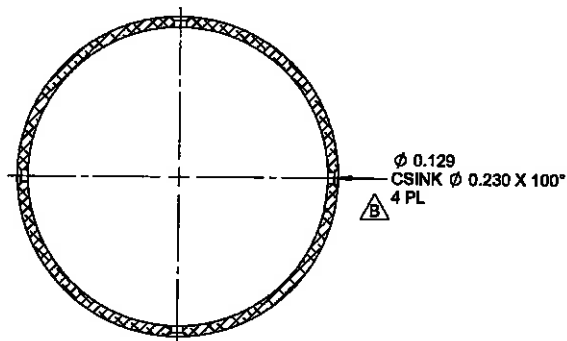
2019 FEB 25

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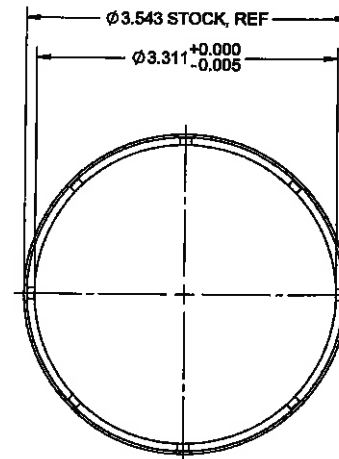
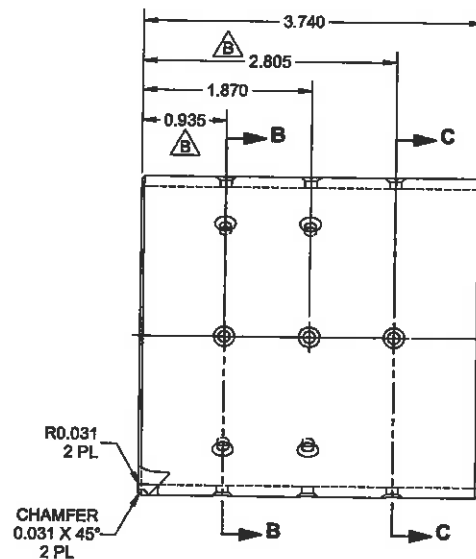
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DRAWN	ZF		
CHECKED	MW	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5610	SHEET 2 OF 3
APPROVED	NO	TITLE	SCALE
DE APPR.	CP	AFT X-TUBE (EC130)	NTS
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SECTION B-B
2 PL



SECTION C-C



D5610-3 CUFF

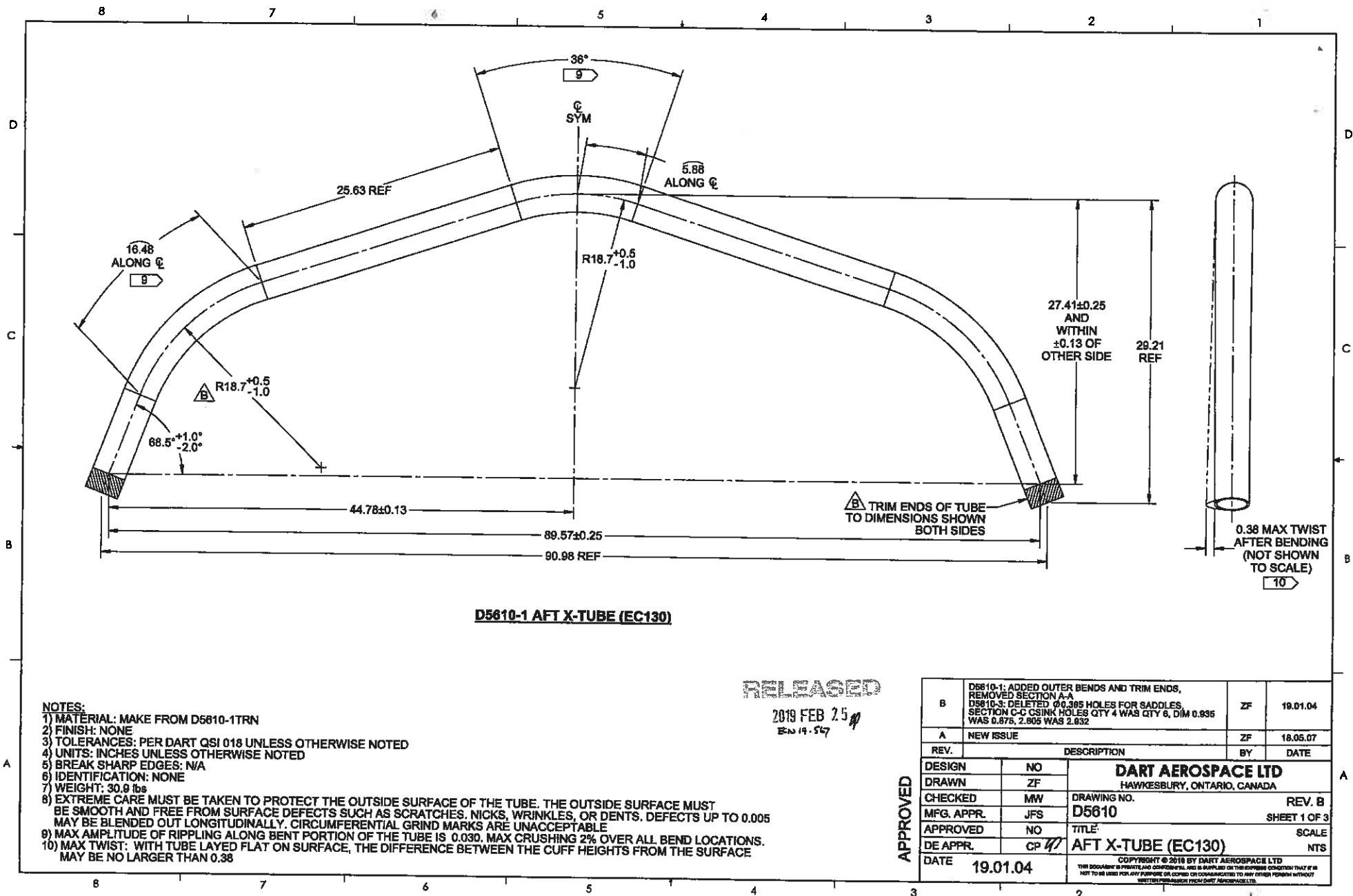
NOTES:

- 1) MATERIAL: MAKE FROM D8030-140
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 0.47 lbs

RELEASED
2019 FEB 25

APPROVED

DESIGN	NO	DART AEROSPACE LTD	
DRAWN	ZF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	MW	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5610	SHEET 3 OF 3
APPROVED	NO	TITLE	SCALE
DE APPR.	CP	AFT X-TUBE (EC130)	NTS
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Entered:

Date:

1R Oct 28/19



NCR No.

19-7586

WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

Route update only ☐

Job: <u>197719</u> Part No. <u>D5610-1 TAN</u>		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒		DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☒ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐																															
Date: <u>19/7/31</u>		Sequence #:		QTY Affected: <u>1</u>		MRB (QSI042) <u>INSP</u> <u>12</u> <u>15/7/31</u>																													
Description Work Order Deviation				Disposition																															
Tube had surface marks in central region of crusstube. 0.005" material was removed in some regions to remove marks.				Acceptable. Min O.D. = 3.536 (-0.007). Previous wall thickness was within 0.001" of nominal. D6020 allows ± 0.015 mean, ± 0.031 eccentricity. Tube is within allowable section properties by inspection.																															
Root Cause Operator ☐ Manufacturing Process ☒ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐				FAULT CATEGORY <table border="0"> <tr> <td>☐ Pressure/Forced</td> <td>☐ Contamination</td> <td>☐ Power Loss/Surge</td> <td>☐ Positioned Wrong</td> </tr> <tr> <td>☐ Bending</td> <td>☐ Misaligned/off center</td> <td>☐ Folio/Program</td> <td>☐ Outside Tolerance</td> </tr> <tr> <td>☐ Crushing</td> <td>☐ BOM/Route</td> <td>☐ Grain Direction</td> <td>☐ Drawing</td> </tr> <tr> <td>☐ Cracks</td> <td>☐ Broken/Damage/Defect</td> <td>☐ Weld</td> <td>☐ Finish</td> </tr> <tr> <td>☐ Crimp/Kink/Ripple/Wave/Twist</td> <td>☐ Incomplete/Unclear Instructions</td> <td>☐ Wrong Stock Pulled</td> <td>☐ Part Lost/Missing</td> </tr> <tr> <td>☒ Marks/Chatter</td> <td>☐ Drill Holes</td> <td>☐ Out of Sequence</td> <td>☐ Misread</td> </tr> <tr> <td>☐ Mislabeled</td> <td>☐ Fit/Function</td> <td>☐ Off-set/Set-up</td> <td></td> </tr> </table>				☐ Pressure/Forced	☐ Contamination	☐ Power Loss/Surge	☐ Positioned Wrong	☐ Bending	☐ Misaligned/off center	☐ Folio/Program	☐ Outside Tolerance	☐ Crushing	☐ BOM/Route	☐ Grain Direction	☐ Drawing	☐ Cracks	☐ Broken/Damage/Defect	☐ Weld	☐ Finish	☐ Crimp/Kink/Ripple/Wave/Twist	☐ Incomplete/Unclear Instructions	☐ Wrong Stock Pulled	☐ Part Lost/Missing	☒ Marks/Chatter	☐ Drill Holes	☐ Out of Sequence	☐ Misread	☐ Mislabeled	☐ Fit/Function	☐ Off-set/Set-up	
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☒ Marks/Chatter	☐ Drill Holes	☐ Out of Sequence	☐ Misread																																
☐ Mislabeled	☐ Fit/Function	☐ Off-set/Set-up																																	
Other/Details:																																			

Completed By

Lead hand / Supervisor

DAS

47

9-89

QC / QA Coordinator

DAS

68

9-89

SEP 05 2019